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ABSTRACT

In a 5-year longitudinal study, the home literacy environments of 60 preschool children in Canada were assessed. Over the preschool and early school experiences of these children, they were administered various measures of meta-literate awareness and later, standarized reading measures, to determine the nature of the home environment's influence on emerging literacy knowledge and reading ability. It is widely believed that school success is related to the environment provided in the home and that home also has an impact on preschool youngsters' development of emerging concepts of literacy and language. The present study did find support for this belief. However, at first glance this support appears far from robust. It is of interest, however, that home literacy environment became more of a factor when combined with age. Higher home literacy 4-year-olds tended to display more literacy knowledge than did lower home literacy environment age mates; this was not generally the case for 3-year-olds. (Contains 26 references.) (Author/TB)

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HOME LITERACY ENVIRONMENT AND YOUNG CHILDREN'S LITERACY KNOWLEDGE AND BEHAVIOR

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HOME LITERACY ENVIRONMENT AND YOUNG CHILDREN'S
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ABSTRACT

In a five-year longitudinal study, the home literacy environments of sixty preschool children were assessed. Over the preschool and early school experiences of these children, they were administered various measures of meta-literate awareness and later, standardized reading measures, to determine the nature of the home environment's influence on emerging literacy knowledge and reading abiity. Modest support for a positive influence of the home literacy environment was found, as well as interactions of this factor with age.

In the 1960's, educators and parents witnessed a new concern for literacy skills, as measured by standardized test results, and a focus on the early years as exemplified in the U.S. project called Head Start. These developments led researchers to examine the preschool years to determine which non-instructional factors were important for the acquisition of literacy skills.

During the ensuing decade, the focus of this research was to determine the best environment in which children would learn to read and write. Longitudinal studies found preschool age links between oral language and emerging reading and writing behaviors (Chomsky, 1972; Bissex, 1980). In the 1980's the view that children's experiences prior to school entry played a significant part in their successful acquisition and development of literacy moved from theory-driven belief to theory-driven research.

Numerous researchers during these two decades based their work on the premise, and then research findings, that children's knowledge of literacy and their literate behaviors begin to emerge in the preschool years (Clay, 1979; Doake, 1981; Ferreiro and Teberosky, 1982; Harste et al., 1984; Heibert, 1981; Lomax and McGhee, 1987; Teale and Sulzby, 1986). Teale (1986 a & b) found that this developing knowledge and abilities were not the result of direct instruction. Rather the learning of and about literacy was usually constructed within the context of interactions in the home between children and parents and/or older siblings.

Research results indicated that literacy development during the preschool years was related to preschool language and literacy experiences. In a series of reports from the University of British Columbia it was learned that: children coming from homes with a predisposition toward literacy were found to have better understandings of story schema (Doiron and Shapiro, 1988); patterns of discourse during book reading episodes were related to the later emergence of print-related literacy skills (Watson and Shapiro, 1988); children entering their school-age years from homes with a predisposition toward literacy appear to have good oral language skills and show signs of a sensitivity to use of decontextualized

language (Reeder, Wakefield and Shapiro, 1988) and this sensitivity emerges earlier than in children from homes with less of a predisposition toward literacy (Reeder and Shapiro, 1993). This latter finding is consisitent with other researchers who observed that children expect language and language experiences to be meaningful and are used to observing adults model literacy skills, especially through book reading (Teale, 1984) and the sharing of stories (Wells, 1985). These children have developed a "sense of story" from their exposure to the narratives of children's literature and are themselves experienced users of narrative (Applebee, 1980). Later literacy skills acquisition in school was also found to be related to forms of language with which the child was already familiar from experiences in the home (Heath, 1983; Snow, 1983). It was believed that children's experiences using story in decontextualized ways developed skills necessary in reading and writing (Wells, 1985).

It is reasonable then to expect that relationships will exist between home literacy environment and/or preschool literacy knowledge and abilities with later reading achievement. This paper will not review the literature on emergent literacy for thorough reviews can be found elsewhere (Mason and Allen, 1986; Shapiro, 1990). Suffice it to say that while many facets of young children's emergence into literacy have been examined, what we have learned about the relationship between family and home environment and aspects of literacy acquisition remains limited. By far the preponderance of research has focused on children's emerging concepts about print and/or their later school reading achievement, albeit their concepts about print are thought to be related to the home literacy environment. The results from many of these studies often can not be generalized beyond their own samples for various reasons. Two recent studies will serve to illustrate this difficulty.

Stewart and Mason (1989) attempted to examine the effects of home environment on aspects of metalinguistic awareness. They studied prekindergarten and kindergarten age children and found

that parent reports of their children's early literacy experiences and how they interacted with their children were related to the children's awareness of reading and writing. Aside from the difficulties inherent in retrospective interviews and the fact that their conclusion was reached from the analysis of only a few case studies, the generalizability of this study was further compromised in two ways. First, the researchers lost sixty per cent of the original sample with the majority coming from one particular classroom. Such a startling rate of subject mortality seriously threatens external validity. Second, the children had in fact received formal reading instruction thus the relationship between early experiences and metalinguistic awareness was confounded. In earlier work on emergent literacy, Mason (1980) while discussing problems with the research in this area pointed out that "...if a child is given instruction at school, it is nearly impossible to disentangle the effects of this from what is learned at home..." (p. 207).

By far the most often cited work regarding home literacy environment is the series of studies by Wells and his colleagues in the Bristol Longitudinal Development Research Programme (Moon and Wells, 1979; Wells, 1985). These researchers discovered a strong relationship between early literacy knowledge, developed through parent/child book reading, and later school reading achievement (word identification and comprehension). The latter study actually indicated that it was an aural story schema building activity, listening to stories, rather than looking at books which had the most impact on preschool literacy understanding and with later reading achievement. While this ground-breaking research is seen as establishing the veracity of the preschool literacy knowledge (specifically the child's emergent concepts of print usually viewed as book knowledge) and later reading achievement relationship, an important confounding variable is often overlooked. In these studies, the measure of preschool print understanding used was a combination of scores from the Concepts of Print Test and a letter-knowledge test. The inclusion of letter identification, a task

historically found to be a predictor of early reading achievement (deHirsch et al., 1966; Durrell, 1958; Walsh et al., 1988) clouds the interpretation of the findings of this research.

The current paper presents part of a larger, multi-faceted examination of emergent literacy and language. A variety of emergent literacy tasks and reading measures were used. While the former tasks have often been labelled under the rubric, meta-linguistic awareness, in this study the term meta-literate or meta-literacy awareness was used since the majority of print awareness measures did not focus on language. The purpose of this phase of the study was to examine: 1) the relationship between the home literacy environment and children's emerging meta-literate awareness and; 2) the relationship between home literacy environment, meta-literacy awareness and reading skills development.

METHOD and PROCEDURES

Sixty three- and four-year-old children, attending a university child study center, formed the original cohort for this study. At the start of the project the mean age for the former group was 3.3 years, while for the latter the mean age was 4.2 years. Fifty children remained in year two. In the third year forty-five children remained, twenty-five of whom were followed into their grade one year for informal reading assessments. A total of forty-four of the children from the original cohort were tracked through grade two and standardized reading achievement scores were recorded for these subjects.

The preschool experience of these children did not include any formal instruction in reading or reading related skills. Children were read to on a daily basis and were free to explore books throughout the preschool day (2 1/2 hours). In many cases, the books which were read to the children were used in conjunction with themes carried through the rest of the curriculum.

Subjects in this study represented various ethnic groups but were decidedly mid- to upper-middle class in terms of their social status. This factor, of course, is a limiting one for the study.

All tests and measures used during the preschool years were administered in the Fall of each year by trained research assistants who had spent time in the children's classrooms. A one month period was set as the time frame for data collection in an attempt to minimize maturation effects. Reading measures used when the children were in grades one and two were administered in the Spring of each year.

Preschool Measures

Home Literacy Environment Index (HLEI) - The HLEI is a researcher created, eighteen item parent questionnaire designed to elicit information regarding the literacy environment and interaction with literacy materials in the home. Areas covered include: quantity and variety of adult and child print material; frequency of children being read to; exposure to the writing process and; modelling of literacy skills. Each item requires a Likert type response which can be scored from 0-4 thus producing differentiated item scores and a range of total HLEI scores. The HLEI was found to have a split-half reliability of .92 and a canonical discriminant function analysis indicated a classification accuracy rate of .78.

Concepts of Print Test - This measure, commonly referred to as the SAND test after the title of the book used to assess children's concepts about print, was designed by Marie Clay (1979) as part of a larger battery of reading measures. Twenty-four questions are asked as the story is read to the child. A factor-analytic study (Day et al., 1981) found that the SAND assesses book orientation concepts, print direction concepts, letter/word concepts, and advanced print concepts such as punctuation and word order. When the initial four year old subjects reached public school, two other measures of the battery, Writing Vocabulary and Sentence Dictation, were used to assess reading ability. These two measures have been found to have high correlations with the Stanford Achievement Test's total reading score and its component subtests (Harlin & Lipa, 1990).

Linguistic Awareness in Reading Readiness Test (LARR) - This measure was designed to be a comprehensive survey of young children's concepts of literacy (Downing et al., 1982). Three subtests are used to assess children's recognition of literate behavior, their understanding of the purposes of literacy, and their knowledge of the language of literacy (initially this subtest was not used since it required some reading ability). On the former

subtests children examine pictures and are asked to circle something in the picture related to the task being assessed.

Lipa Logo Test - This measure is used to assess young children's ability to read environmental print (Lipa, 1984). Subjects are shown twelve familiar product logos with total contextual support and again, with reduced contextual support. Two response categories, generic and specific, are possible for each logo and word label (reduced contextual support condition).

Mow-Motorcycle Test - This measure of ability to map the spoken word with its orthographic representation (Rosin et al. 1974) is now part of the Written Language Awareness Test (Evans et al., 1979). Subjects are shown two words, one relatively brief in length and the other quite a bit longer. One word is read to the child who then must point to the appropriate written match. Of all the measures used in this study, the Mow-Motorcycle is the only one which might be considered a measure of meta-linguistic awareness (see earlier discussion of meta-literate vs. meta-linguistic awareness).

Identification of Written Language Test (IWLT) - Another subtest of the Written Language Awareness Test, it is designed to assess the ability to discriminate writing from other marks. Subjects examine messages written in manuscript and in cursive writing, as well as strings of geometric shapes and letter-like forms.

Story Retelling Task - Used to assess children's developing sense of story, in this task subjects are given a wordless picture book, Pancakes for Breakfast (dePaola, 1978) to examine. After looking through the book they are directed to tell a story using the book to a stuffed animal sitting next to them. Retellings are examined for number of story elements included and for number of literary devices (e.g. intonation, dialogue) used in the retelling.

RESULTS

Home Literacy Environment and Meta-Literate Awareness

Pearson Product Moment Correlation Coefficients were computed between the Home Literacy Environment Index (HLEI) and all other measures during the first two years of the study. Correlations for the third year of the study were not conducted because some members

of the original cohort had entered grade one and were administered different measures. The number of remaining preschool subjects was too small, considering the number of measures administered, to compute correlations.

In the first year the home literacy environment, as measured by the HLEI, was only related to performance on the Concepts of Print measure (SAND). Although statistically significant this relationship was relatively small ($r = .21$, $p < .05$).

When these relationships were examined by age groups, it was found that HLEI was unrelated to SAND for the younger children. However, a relationship between HLEI and Recognizing Literacy Behavior ($r = .35$, $p < .05$) was found for this age group. A much stronger relationship between HLEI and SAND ($r = .48$, $p < .01$) emerged for the older children. Also, with the older group, a moderate relationship between HLEI and the Identification of Written Language Test was discovered ($r = .47$, $p < .01$).

Also during this year, children at the extreme ends of the HLEI were compared on the Story Retelling Task. An analysis of variance was conducted for the number of story elements they included and the literary devices they employed in their retellings. Significant differences were found for the number of story elements ($F = 7.5$, $p < .001$) high HLEI four-year-olds included compared to lower HLEI four year olds. The former group retold more than twice as many of the story actions. In fact, the latter group did not produce significantly more story elements than the three-year-olds. Differences in the Literary Devices employed during the retelling were also significant ($F = 9.74$, $p < .001$). Higher HLEI four-year-olds were significantly ($p < .05$) superior to lower HLEI four-year-olds and used intonation, emphasis on words, descriptive language, interjections and literary language much more frequently. Lower HLEI four-year-olds included more literary devices than did higher HLEI and lower HLEI three-year-olds. Story Elements for three-year-olds also differed but did not reach significance. However, of some interest was the pattern of differences between these three groups. In the use of intonation

and emphasis on words, lower HLEI four-year-olds and higher HLEI three-year-olds were identical. Differences were seen for use of literary language and descriptive language with the lower HLEI four -year olds superior to both groups of three-year-olds and no differences between the latter groups.

Correlations for the second year, when the children were four and five years old, included four new areas: story concepts, represented by Story Elements and Literary Devices, a visual boundary task and the third subtest of the LARR, "Technical Language of Literacy". The latter measure had been previously excluded due to the fact that it required some reading ability beyond the reading of environmental print.

The resulting correlations were generally stronger but still remained in the low to moderate range. Home literacy environment (HLEI) was no longer related to SAND or to LARR's "Recognizing Literacy Behavior" and "Technical Language of Literacy". However, HLEI was found to be related to the second subtest, "Understanding Literacy Functions" ($r = .41$, $p < .01$). It is likely that the "Technical Language of Literacy" subtest was still too difficult for this age group. This argument is strengthened by the fact that HLEI was related to SAND's most difficult area, Advanced Print Concepts ($r = .33$, $p < .01$), which does not require as much reading ability. HLEI also generated significant, but low correlations with the meta- linguistic measure MOW/MOTORCYCLE task ($r = .26$, $p < .01$) and the specific environmental print reading components of the Lipa Logo Test ($r = .24$, and $r = .26$ $p < .01$ respectively).

Since the number of measures used was rather large and the possibility existed that some of these measures were tapping into similar underlying structures, a series of factor analyses were conducted for the various years of the study. Factor solutions had to obtain eigenvalues greater than 1.0 and individual loadings of .60 or higher. The following five factors and the variance they account for were obtained (the measures loading on each factor appear in the hypotheses): Environmental Print Identification - 24% (specific logo and word label responses); Environmental Print

Recognition - 17% (generic logo and word label responses); Easy Concepts of Print - 12% (SAND's Book Orientation and Print Direction + LARR's "Recognizing Literacy Behavior"); Discrimination of Print - 11% (IWLT and MOW/MOTORCYCLE); and Harder Concepts of Print - 10% (SAND's Letter/Word Concepts and Advanced Print Concepts + LARR's "Understanding Literacy Functions"). Factor scores were then derived to examine the effects of home literacy environment.

Three- and four-year old subjects were divided at the median for their HLEI score. Analyses of variance were then performed on the data. A significant difference was found for the first factor, Environmental Print Identification ($p < .02$). Tukey-HSD post hoc analysis indicated that four-year-olds from higher home literacy environments were significantly superior to their age mates from lower home literacy environments. Three-year-olds from higher literacy homes also had higher scores than four-year-olds from lower home literacy environments but this finding did not reach statistical significance.

When subjects were one year older a four factor solution was obtained (note that Sense of story tasks were included with this data set): Environmental Print Identification - 33% (same as above + Discrimination of Print measures and SAND's Advanced Print Concepts); Easier Concepts of Print - 14%; Story Concepts - 12% (Story Elements and Literary Devices); and Environmental Print Recognition (10%). The merging of Harder Concepts of Print (meta-literate tasks), Word Label reading, and Meta-linguistic awareness (MOW/MOTORCYCLE) as the children aged is of developmental interest. Analyses of variance with this set of factor scores yielded a significant difference of HLEI, again favoring the four-year old group, only for Factor 2: Concepts of Print.

Home Literacy Environment and Later Reading Achievement

When the four-year-olds of the original cohort reached grade one they were administered two additional parts of the Clay Battery to examine reading ability (school district policies prohibited standardized measures). The Writing Vocabulary task, in which

children have ten minutes to write down all the words they know, and the Sentence Dictation task, where subjects write a dictated sentence, were used. When these two measures were entered into a factor analysis they loaded together forming a distinct factor. Since words had to be written correctly on both of these measures to receive credit, this factor was conceptualized as a form of word recognition assuming that the ability to write words correctly required the ability to read them accurately. This assumption was supported by Harlin and Lipa (1990) who found these two measures to be highly predictive of performance on the Stanford Achievement Test's total reading score.

Pearson Product Moment correlations were calculated between the preschool variables and the Factor score derived from the combination of Writing Vocabulary and Sentence Dictation. No HLEI relationship was found with this Reading variable for the twenty-five children.

In the two subsequent years, standardized testing of the school age population became possible using the Gates-MacGinitie Reading Test. Path Analyses were conducted with Home Literacy Environment (HLEI), Grade One and Grade Two Gates-MacGinitie scores, and the variables derived from a three factor solution, which emerged when commonalities across all three preschool years were considered. These conceptually strong areas were labelled: Story Concepts from the story retelling task; Print Concepts from the SAND and LARR, and; Symbol Concepts from the Lipa Logo Test. The conceptualized path tested was the separate contribution of each preschool variable and HLEI to the outcome measures.

For the Grade One Gates-MacGinitie score, significant path coefficients were reported for HLEI (.71, $p < .01$) and Story Concepts in Year One (.43, $p < .04$). No other path coefficients were significant and with the exception of two relationships, each year's preschool variables did not have significant coefficients. HLEI was not a significant contributor for Grade Two Gates-MacGinitie scores.

DISCUSSION

It is widely believed that school success is related to the environment provided in the home and that home also has a large impact on preschool youngsters' development of emerging concepts of literacy and language. The present study did find support for this belief. However, at first glance this support appears far from robust. While low to moderate relationships between home literacy environment and some meta-literate tasks were seen, they were primarily the former. For the youngest preschool children in this study, the home literacy environment was found to be related to their emerging Concepts of Print (SAND) scores. For older preschoolers the literacy environment of the home was somewhat related to their abilities to identify environmental print and to map a spoken word to its orthographic representation. With this group a stronger relationship was seen between the home literacy environment and the children's understandings of the functions of literacy.

When a more conservative test of this relationship was explored, by using scores derived from factor analyses, the support for the relationship of home literacy environment to preschool children's emerging meta-literate concepts weakened. The only significant correlation occurred with Story Concepts of four-year old children. However, this lends some support for Wells' notion of the importance of reading to young children.

It is of interest, however, that home literacy environment became more of a factor when combined with age. Higher home literacy four-year-olds tended to display more literacy knowledge than did lower home literacy environment age mates, while this was not generally the case for three-year-olds. Of some relevance to the belief that home environment is important was the finding on two tasks, SAND's Advanced Print Concepts and MOW/MOTORCYCLE (the meta-linguistic awareness task), that higher home literacy environment three-year-olds outperformed lower home literacy environment four-year-olds. On the former task the difference was found to be statistically significant. However, like the

correlational analyses, when factor scores were used the findings weakened. Significant differences were only found for Environmental Print Identification in Year One and Concepts of Print in Year Two.

At first consideration, the lack of robust support for the relationship between home literacy environment and children's emerging awareness of literacy is surprising since it is accepted that a relationship exists. One possible explanation lies with the instrument used to elicit information on the home literacy environment. Since this instrument was a questionnaire filled out at home without the presence of the researcher, it is possible that parents misreported. However, in pilot studies home visits confirmed most parental responses. This fact plus the size of the sample led to the belief that misreporting would not be a problem. As well, misreporting can also occur during interviews, although elaboration can be sought in that mode. Since this could not be done with the HLEI it remains possible that some differences between homes might have been lost due to the misreporting factor. Another possible explanation lies with the fact that the HLEI was only administered in the first year of the project. It could be that the home literacy environment changed enough that by the later years in the project early differences were washed out by later environmental and socialization practices.

A more likely explanation for the lack of a strong relationship between HLEI and meta-literate tasks lies in the composition of the sample. The University Child Study Center, like other university affiliated preschools, attracts highly literate parents. We can therefore assume that while some of the children came from relatively low income homes, all children most likely lived in homes with a high bias toward literacy. In all likelihood this bias would mask differences in performance on meta-literate tasks. Since some significant correlations were found with this narrow-ranged sample between higher and lower home literacy environment four- year olds, and on some tasks higher home literacy environment three-year-olds outperformed lower home literacy environment four- year olds the modest results of this study may be

viewed in a more positive light. Had the sample been more diverse in their home literacy environment it is possible that stronger relationships would have been discovered.

Similar to the results regarding the relationship of home literacy environment with meta-literate awareness were the findings between home literacy environment and school reading achievement. Findings were inconsistent. Correlations between these two variables were not significant when the Clay Battery subtests comprised the reading measure. However, when a path analysis was conducted using the Grade One Gates-MacGinitie scores, the home environment was a significant predictor of reading achievement. Possible explanations for this inconsistency might center around the different measures of reading and/or the similar backgrounds of the sample population.

In conclusion, it has long been thought that a relationship must exist between the home environment and young children's emergent literacy and later reading achievement. This study lends modest support for that thesis. With a relatively upper middle class population, differences in home literacy environment were related to some differential performance on meta-literate tasks. Along with age-related differences, and interactions between age and home literacy environment, we see that the manner in which several aspects of meta-literate awareness emerge can vary. As well, there was some indication that home literacy environment might also be related to grade one reading achievement scores. It became clear in this study that the home environment might have some impact on the order of differences which emerged in some of the aspects of meta-literate knowledge because in some areas, such as Story Concepts, three-year-olds from higher literacy environment homes outperformed four-year-olds from homes with a lower bias toward literacy. These findings hold implications for curricula decisions made with these age groups in that all instructional decisions should be reached in conjunction with examination of the meta-literate knowledge which children bring from the home. Above all, reading educators must design programs which will nurture the

emergent knowledge which young children from varying backgrounds possess.

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